

LAND & LEGACY

A PUBLICATION FOR LANDOWNERS
IN THE UPPER BIG BLUE
NATURAL RESOURCES DISTRICT



ISSUE 01 | AUGUST 2024

Hello, neighbor.

Like you, I am a landowner in the Upper Big Blue Natural Resources District (NRD). I have been farming in Filmore County for more than 50 years, raising hogs, cattle, and irrigated corn and soy. I have also been a part of the board of directors of the Upper Big Blue NRD for 15 years.

As stewards of this land, we all share a responsibility for conservation and

for its health. For generations, our families have relied on the bounty of our acres, and it's our duty to ensure that future generations can do the same.

That's where the NRD comes in. There are many programs available that will help to protect your natural resources, maintain the health of your soil and protect water resources. These programs also protect public resources including streams and rivers, and recreation areas that

benefit all. You'll learn more about these programs in this publication. We must be proactive in protecting these essential resources if we want to create a more resilient and flourishing Nebraska.

Let's work together to leave a legacy of healthy land and abundant harvests for generations to come.



Lynn Yates
Board Chairperson
Upper Big Blue NRD

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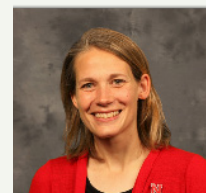
CONSERVATION CONVERSATIONS

I'm blessed by the various conversations held with people. Some of these are with landowners and/or tenants desirous of incorporating more conservation practices on their farms.

From the landowner's perspective, the conversations have centered around concern of soil erosion, fewer trees, wildlife, and long-term productivity of the farmland. Some don't feel

they have a right to ask a tenant to change something even though they own the land; they often don't want to "rock the boat."

From the tenant's perspective, how to show financial benefit in implementing conservation practices is a main topic. Those on crop share leases are concerned about impacting yields and profitability to the landlord sharing the risk. Those with cash rent leases are concerned about obtaining "buy-in" and/or losing the ground if the practice looks different or doesn't obtain the highest yields.



Jenny Rees
Nebraska Extension

continued back page



For private well owners, it's important to test drinking water annually, as results can change from year to year.

The NRD offers free water testing to determine if a well is providing safe drinking water. Anyone in the district can request a simple at-home test by emailing info@upperbigblue.org or calling the office at (402)362-6601. The at-home tests provide fast results but are not as sensitive and accurate as a lab test. For the best results, a sample should be brought to the office for free lab analysis. Instructions for how to collect a sample to bring in for analysis are at www.upperbigblue.org/water-testing.

If a lab test reveals that the water sample is above 10 PPM, funding is available for the homeowner through the NRD for the installation of a point-of-use reverse osmosis system. A properly installed and regularly maintained reverse osmosis system can remediate the risk associated with nitrates in water. To see full program guidelines, visit www.upperbigblue.org/RO.

WATER QUALITY & HEALTH

Water testing and RO system funding available

If a home's water comes from a private well in Nebraska, it may have elevated levels of common nutrients found in agricultural fertilizers in drinking water. Consuming water with elevated levels of nitrate can have significant health risks. Annual testing of your water is an important way to protect the health of everyone in your home.

Numerous scientific studies have looked at the relationship of nitrate in drinking water on human health and linked high concentrations of nitrate in drinking water to adverse health outcomes. The strongest links are for methemoglobinemia, colorectal cancer, thyroid disease, and neural tube defects (birth defects of spine, brain, and spinal cord). Agrochemicals in drinking water are also linked to increased heart rate, nausea, headaches, and abdominal cramps; cancers including pediatric brain cancer, kidney cancer, bladder cancer, and non-Hodgkin's lymphoma. Other studies are also examining a possible link between

these contaminants and Alzheimer's, diabetes, and Parkinson's disease.

Nebraska has one of the highest rates of some pediatric cancers, which may be linked to agrochemicals in drinking water. When it comes to health concerns and drinking water quality in Nebraska, the most vulnerable populations are young infants (less than six months old), pregnant women and children in-utero, and people with oxygen transport or delivery conditions like anemia, cardiovascular disease, lung disease, and sepsis.

The EPA guideline for safe drinking water is less than 10 parts per million of nitrate. Municipalities are required by law to provide water that meets the EPA criteria, but for the many Nebraskans whose water comes from a private source, the quality of the water is the consumer's responsibility.

WATER QUANTITY IN THE DISTRICT

Each spring, NRD staff measure a network of wells across the district and report on the status of the local water level. This is a valuable indicator of the health and longevity of the aquifer on which most Nebraskans depend for domestic and agricultural uses. Without a properly managed aquifer, large scale agriculture would not be possible in the long term. The Upper Big Blue NRD sits above the High Plains Aquifer (also known as the Ogallala Aquifer), which stretches from South Dakota to Texas. This portion of the aquifer is dynamic and factors like rainfall and pumping affect how the aquifer reacts.

This year, the NRD reported a district average water level decline of 3.08 feet. This is the third consecutive year of water level decline in the district, due to the sustained drought conditions throughout the region. In times like these, irrigation best management practices are essential to safeguarding this precious natural resource.

In recent years, producers have done an exceptional job of managing use of district water resources and cooperating with the NRD on conservation activities and monitoring. Along with NRD staff measuring observation wells, all

groundwater users are required to annually report their water use. This is how the NRD maintains records on historic groundwater usage. Groundwater use records are very important to the district for making informed management decisions. The 2023 district average groundwater usage was 9.56 inches/acre. The district average groundwater usage is 6.2 inches/year since 2007.

The district's goal is to hold the average groundwater level at or above the 1978 level. In 2005, the district average groundwater level reached the "Reporting Trigger," initiating mandatory reporting of annual groundwater use to the district and certification of irrigated acres. If the district average water level falls below the 1978 level ("Allocation Trigger"), groundwater allocation will begin.

The spring 2024 average groundwater level was 3.6 feet above the "Allocation Trigger." While no allocation rules are currently in effect, all irrigators are encouraged to be mindful of their water usage and to manage their irrigation efficiently.

Irrigation scheduling is a critical part of good irrigation water management. Over-irrigation increases production cost, can reduce crop yields, and leaches nitrates out

of the crop root zone which pollutes the groundwater. Simple management tools are available, which can help the irrigator decide when it is appropriate to irrigate and when he or she can wait.

The district sells several of these tools at a fifty-percent (50%) discount to irrigators in the district. The equipment is also for sale to others at regular prices. The irrigation scheduling equipment available includes moisture sensors, handheld meters, data loggers, evapotranspiration gauges, and soil probes.

Allocation and Pooling

The district is well prepared in case of a groundwater shortage. Groundwater allocation rules and regulations were set by the Board of Directors in 1978 and have been updated several times in the past 45 years. Action by the Board of Directors of the NRD is the only way to modify these rules. Allocation is defined as the apportioning of groundwater. The district has allocation rules for agricultural, municipal, and other groundwater users.

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OLD WELL? CAP IT!

NRD provides funds for properly decommissioning inactive wells

Water wells are tremendous tools. Their flows irrigate thirsty crops and livestock. They supply families with water for drinking, washing, and more. But what happens when a well no longer serves a need – like forgotten wells where homesteads once stood – or farm and livestock wells left obsolete after farm management changes or when land changes hands?

There are hundreds of these inactive wells across the district—and there may be one on your property. Each one provides a direct passageway for pollution to reach groundwater aquifers. Contaminants from the surface such as fertilizer, animal wastes, or agricultural chemicals can travel through the unsealed well to the aquifer. Improperly decommissioned wells pose a potential groundwater quality and public safety risk.

Nebraska law requires landowners to hire a licensed contractor to properly decommission wells. The process of plugging a well requires a series of well-planned steps. Simply dumping fill material into the well is not the way to do it! The well needs to be properly sealed to avoid potential contamination.

The Upper Big Blue NRD has a cost-share assistance program for landowners to make it affordable to have a well properly decommissioned. The program provides 60 percent cost-share, up to \$1,000, for the process. A licensed well decommissioning firm must do the work and decommissioning must be in accordance with Nebraska Department of Health regulations.

For more information on well abandonment or an application for cost-share assistance, contact the NRD at 402-362-6601.

Water Quantity in the District *(from page 3)*

If the groundwater level falls below the threshold set in 1978, allocation rules and regulations would become effective on January 1 of the following year. The Board of Directors will set the duration of the groundwater use period and allocation amount by September 1 prior to the start of the initial and each subsequent groundwater use period. Current rules allow for the first groundwater use period to be for 36 months; the second groundwater use period, if enacted, would be for 60 months. The groundwater allocation for the first groundwater use period (36 months) would be 30 inches per certified groundwater use acre. The groundwater allocation for the second groundwater use period (60 months) would be 45 inches per certified groundwater use acre.

Allocation pools allow groundwater users flexibility to use allocation water over multiple fields based on well, owner-operators, or agreement pool. For the specific rules for pooling, see District Rule 5, Chapter 12. The NRD has also begun to mail pooling and allocation summary documents to producers so they have a better understanding of how allocation rules might impact their operation in the future.

If you have questions about water levels, irrigation scheduling equipment, or allocation, please contact NRD Water Department Manager Terry Julesgard at tjulesgard@upperbigblue.org or call the office at (402) 362-6601.



Watermark sensors

Upper Big Blue Natural Resources District

Phase II/III Report
2024 Phase II/III

To Do

- Phase II/III
- Phase II/III
- Phase II/III
- Phase II/III

Submitted

Approved

- G- - Irrig Water Use
York, Sec 09N- - NESW
- G- - Irrig Water Use
York, Sec 09N- - SWNE
- G- - Irrig Water Use
York, Sec 09N- - SWNE
- G- - Irrig Water Use
York, Sec 09N- - SWNE

New Document

Legal Description
35- E1/2 NW1/4

Farm Name

Total Acres
79.58

Entry Comment

Primary Operator

Landowner

Date
11/19/2023

Please Attach Lab Report

Operating Partner(s)

Event **Date** **Note** **Status** **Actual Yield** **Add New Practice**

Save **Cancel** **Submit**



FLOWMETER REPAIR COST-SHARE

The cost-share amount for repairs of district water flowmeters recently increased from 50 percent of total cost up to \$300, to 50 percent of total cost up to \$500 per flowmeter. The program will allow for the replacement of electronic flowmeters which are not repairable with new or refurbished mechanical flowmeters. The maximum cost-share per landowner for flowmeter repair is \$1,000 per fiscal year.

NOTES ON REPORTING

The work of managing our natural resources depends on everyone in the district working together, and that includes landowners as well as tenants!

Many reports can be submitted online through our reporting platform (an anonymized screenshot is above) or by completing paper forms and mailing them to the NRD.

- **Reporting:** Each year there are a few reports that need to be completed and submitted by the person who is operating your acres or their authorized agent. The consequences of not completing these forms may include cease-and-desist orders for irrigation or fines.
- **Nitrogen Use:** For acres in the Hastings Wellhead Protection Area or a Phase II or Phase III nitrogen management area (this includes all or parts of Adams, Clay, Hamilton, Polk, Seward, and York Counties), a form

must be submitted to the NRD regarding nitrogen management practices and soil analysis each year by April 1. This form will contain data for each field including information used to calculate a recommendation for nitrogen application.

- **Irrigation Withdrawal:** For irrigated acres, the amount of water pumped per well each year must be reported by December 1. This amount is determined by flowmeter readings reported by the operator. All irrigation wells in the district are required to have a functioning flowmeter (see sidebar).

If you have changes to your number of certified acres or a different person should be listed as the operator of those acres, please let us know! Send this information to water@upperbigblue.org or call (402) 362-6601.



NRD PROGRAMS TO SUPPORT CONSERVATION & AGRICULTURE

PRIVATE DAMS, COVER CROPS, CHEMIGATION AND MORE

Conservation and agriculture are not opposing forces but can in fact work hand in hand to improve the land. The Upper Big Blue NRD has many programs available to help you manage soil and water resources effectively to increase productivity and sustainability on your acres.

- **Private dams**—Imagine a multipurpose pond on your property. In addition to providing storm water storage, flood mitigation, and groundwater recharge, a dam with a conservation pool could be a gathering place for wildlife... and a great place to cast a line. The NRD's Private Dams Program provides planning, design and financial assistance for the construction or reconstruction of dams located on private property. These dams generally have a cost exceeding \$15,000 and have a drainage area of approximately 80 to 640 acres. The NRD has recently increased the amount available to landowners through this program, to 75 percent of the project, up to \$75,000.
- **Cover Crops, grassed waterways, and buffer strips**—Your land isn't worth as much if the soil is blowing or washing away. Since the topsoil layer is essential for maintaining fertility, keep

your soil in place with erosion prevention measures such as cover crops. Keeping a growing root in the ground year-round adds carbon to your soil and holds the soil in place. The Upper Big Blue NRD has several programs available to offset the cost of cover crops. Similarly, grassed water ways and buffer strips are an easy way to keep soil and agrochemicals from entering streams and rivers. This is important for water quality, as well as erosion prevention. The NRD also has funding available for these practices.

- **Chemigation**—Chemigation, sometimes called fertigation, uses a center pivot or subsurface drip irrigation system to apply fertilizer and/or pesticides to growing crops.

Chemigation is an environmentally friendly method to apply fertilizer and pesticide to growing crops by spoon-feeding the plant's nutrient needs based on the yield goal and growth stage of the crop. It also saves time and labor by not having to go over a field multiple times for equipment applications. When fertilizer is applied before plants are growing as often happens, there is a risk that the fertilizer

will leach below the plants' rootzone if there is a lot of rain prior to the growth period. Chemigation also mitigates the risk associated with natural disasters, such as a hail event, that could destroy the crop and leave the applied nitrogen left in the soil unused, where it will eventually leach into the aquifer.

Many growers that use chemigation in their operations report that they have noticed an increase in crop yields. A lot of growers especially like having another tool in their toolbox in case mid-season tissue samples show that they are lacking a certain nutrient, or they develop a pest problem.

Ready to try it on your pivots? The NRD's Chemigation Equipment Cost-Share Incentive Program provides a cost-share rate of 50 percent of the actual cost, up to \$1,000 per site, for the purchase of new chemigation equipment and a chemigation permit. For details, please visit our website.

FARMER TALK

Producers Share Experiences with Regenerative Agriculture

One of the highlights of the Regenerative Agriculture Conference the NRD hosted in spring 2024 was a chance to hear from Nebraska farmers, discussing their implementation of regenerative practices and the lessons they've learned through trial and error on their farms.

Dennis Fitzke, who farms near Edgar, reported on how cover crops and no-till pay off in a very dry year. "How much rain did you get? I definitely got it all," he likes to quip. Mycorrhizal fungi can access water for your crop even when there hasn't been rain, he said.

Fitzke began no-till in 1994 and continued doing it because it made him more money for less work. He joked that he has found a financially successful model of farming that goes like this: no tillage + low inputs + no insurance + no debt = more profit.

Fitzke noted the advice of soil experts who say a farmer should always carry a shovel and a soil probe, because what they need to know is underground. "There's no silver bullet

for profitability," said Fitzke. You can't implement one new practice and assume that's what will make a difference. Instead, it takes a whole systems approach, because each practice works together, cascading, and compounding forward.

Hank McGowan, who farms in McCool Junction, discussed the challenges of changing family systems. He farms with his father, who was initially resistant to adding conservation practices on their acres. McGowan started planting cover crops to provide an additional source of forage for his cattle and soon discovered that the practice had other benefits, including a reduction of erosion on his roughest land. "If you're a livestock producer, [cover crops are] a slam dunk," he said.

McGowan recommended that farmers that want to implement regenerative practices take their worst field and add cover crops there first, as it is where they would have the least to lose and would potentially see improvements fastest.

Aaron Studebaker, who farms near Davey, Nebraska, has been using no-till in some capacity since 2006. He recommends cereal rye as a "bulletproof" cover crop, especially useful for weed suppression. "We are running out of chemical options for weeds," he said, which is why planting rye as a cover crop or a second cash crop in a double cropping system can be so valuable. Another advantage Studebaker has seen with cover crops is erosion control on tricky contoured fields. Additionally, the harvested rye reduces his need for other feed for his cattle through the winter.

'We've always done it that way' is a toxic mentality for a farmer, said Studebaker, who recommended making SMART goals: Specific, Measurable, Attainable, Relevant, and Timely. Once the goals are set, hold yourself accountable. How are you improving year over year? "If you can't measure it, you can't improve it," he said.

"There's no silver bullet for profitability."

~Dennis Fitzke

"If you're a livestock producer, cover crops are a slam dunk."

~Hank McGowan

"If you can't measure it, you can't improve it."

~Aaron Studebaker



FITZKE



MCGOWAN



STUDEBAKER



Todd Dzingle (left) displays a roller crimper beside a field of corn with a thick mat of cover crop residue during a recent farmer field day.

CHASING PROFIT

Nebraska farmer uses conservation practices to improve soil and financial returns

If your idea of a successful Nebraska farmer is one who has the biggest equipment, and whose fields are regularly turned, black soil with nothing but corn in perfect rows all the way to the horizon, then Todd Dzingle's operation might disappoint you.

Dzingle's corn and soybean fields in Hall, Adams, Clay, and Sherman Counties includes no-till on all of his acres and cover crops on the majority of them. "I'm after soil health, and profit per acre along the way," he said. The challenge he has set for himself is to use the least amount of inputs while raising quality yields, making the return on investment for each bushel as high as possible.

"I'm happy with the yields, and each year I'm seeing better yields as I'm increasing my soil health. I want my investment per acre to be as slim as possible without sacrificing yield," he said. Like any new practice this takes a little time, patience, and a positive attitude.

Dzingle applies nitrogen sparingly, opting instead to do all he can to boost the health of his soil, with the understanding a well-functioning soil system is the key to success. "I want to take care of the land. I'm not farming year-to-year. I'm looking five years plus down the road," he said.

Dzingle grew up farming with his grandpa and dad and later worked with local farmer Kurt Unger on his farm. He started his career as a crop consultant with Servi-Tech, helping other farmers make decisions about their most important resource, their soil. By 2009, he was ready to see for himself if there was any power in what he had been

preaching. He rented 90 acres of ground from his dad and started farming his own way, including transitioning to conservation tillage. Over the years, he added more acres to his operation and more practices to those acres.

For some, the multi-generational aspect of farming can be a barrier to getting started with conservation practices, as there is pressure from the previous generations to farm 'the way we've always done it.' Dzingle said he was fortunate that he didn't have that problem, as his dad was supportive of trying out new strategies along with Unger.

Informed and equipped by soil health experts like Dean Krull, Gabe Brown, Ray Archuleta, Keith Berns, and advice from Kurt and Lisa Unger, Dzingle started experimenting with cover crops in 2016. He quickly discovered that using conservation practices requires courage and constant learning. "If you're not messing up, you're not trying hard enough," he said. "You have to manage cover crops. I've had some bumps and bruises, but nothing that's going to make me stop trying."

Early on in his experimentation, he added a spring mix cover crop on a gravity irrigated area on a pivot corner, planting green. "Everything looked great, and then it just turned super dry and windy for about three weeks," he recalled. "The oats pulled some moisture in and the ground started to crack and the corn started to suffer."

The corn ended up being shorter on the corners, however, "It still ended up yielding right with the rest," he said. The lesson he learned? "I should have had the cover crop sprayed sooner." And yet, he did see excellent weed

suppression in the cover cropped area and the next time he hilled the ground he was amazed at how loose the soil was. “There was a positive out of the mistake. That was a definite light bulb moment for me. I could see how the tough clay had structure and really softened the ground from the cover that was planted.”

Another light bulb moment for Dzingle was during the intense flooding across much of Nebraska in the spring of 2019. When the water receded from his farm in Sherman County, he noticed where he had planted rye the previous fall, he didn’t have soil loss, though the sandy soil was prone to erosion on the slopes. “I was really impressed that I just didn’t have the washing or the issues where I had the rye. That really sold me,” he said.

By the 2020 growing season, Dzingle was all in on cover crops. He purchased a 30-foot no-till drill and significantly increased the number of acres he had in cover crops.

Doing more with less is the strategy that excites Dzingle when it comes to farming. The longer he farms this way and the more comfortable he becomes with experimentation, the more willing he is to push the envelope. For example, he likes to wait until the last possible moment to terminate cover crops to get the maximum benefit of those plants building biomass and keeping the soil active. However, for a farmer who is just getting started with cover crops, he recommends early termination, especially if they are unsure about the timing. “Just pick a date and spray,” he said, as you’re still going to be better off having the cover crops on the ground for even a short amount of time than not having them at all.

How does he know if his investment in soil health is paying off? Other than the obvious benefits he has seen year after year including improved soil structure and infiltration rates, the proof is in the lab results. He samples annually and has seen a steady increase in soil organic matter. He also bases his fertilizer strategy on what

the test results tell him he already has available in the soil. After all, fertilizer is expensive, and since his goal is to get the most return with the least investment, it makes sense to add only as much nitrogen as is needed.

These continuous improvements motivate Dzingle to do more for the soil. In the upcoming year, he plans to move from a single species cover crop to a multi-species mix. Eventually, he plans to integrate livestock into the operation.

“Start with what you are comfortable with and have an open mind. Commit to a course of action for 3-5 years before you decide if it’s working or not.”

While he jumped into conservation farming practices with both feet, he suggests that others set their own pace, even if that just means a small amount of acres in the first year.

“Start with what you are comfortable with and have an open mind,” he said. “Commit to a course of action for three to five years before you decide if it is working or not.”

He also recommends getting in touch with local resources and programs through agencies that offer support and funding, such as Natural Resources Conservation Service (NRCS) and NRDs. “They have been good to work with. No one has been pushy. They are encouraging and supportive. They like to see you making the changes.”

While no-till with cover crops and livestock is the ideal, Dzingle says that one tillage pass is far better than three, and cover crops on a

few acres is much better than none. He encourages others to look more closely at what they are doing to see where there could be improvement--and that goes for landowners as much as operators. “Landowners renting out their ground need to work with the producer. You shouldn’t put it all on the farmer to make these changes,” he said, because if it’s your soil, you should be investing in it. Rented land can create a disconnect from the soil where neither party truly feels like they are a steward.

The biggest hurdle for some farmers in implementing conservation practices is the fear of what the landlord or others will say, especially if they make a mistake, Dzingle said. He tells other farmers to “have blinders on to begin with, be confident and okay with seeing your fields look different from conventional practices, the end product will still turn out.”

Most are hesitant to step outside the boundaries of conventional agriculture, he said. But as for him, “It feels good to work with nature and getting the soil back to a healthy state while improving yields with less inputs.”

Interested in implementing cover crops or other conservation practices on your acres? The Upper Big Blue NRD can help. Call (402)362-6601 to get started.





PRECISION AG ADVANCEMENTS

Recent precision technology advancements are making farming more profitable and more sustainable. While the district doesn't want to be seen as promoting individual businesses, there are two innovations that are bringing greater nitrogen and irrigation efficiency to producers that we think are worth mentioning: autonomous watering and fertilizer systems, and sensor-based nitrogen prescriptions. While it's the practice and technology we hope to promote, currently each of these advancements are available only through individual companies. Both utilize chemigation (see page 6) to provide site-specific application of water and nutrients, reducing the amount of runoff and leaching. This means a cost savings through using less inputs, as well as increased yields, as optimizing fertilizer and irrigation applications leads to healthier crops. These technologies also protect water quality and quantity in the district.

Sensor-Based Nitrogen Prescriptions

By Curt Arens, Editor, *Nebraska Farmer* (used with permission)

What if someone told you that you could boost your nitrogen efficiency by 25% and save up to 43 pounds of nitrogen per acre?

Would you be all in?

With soaring input costs, including fertilizer, along with continuing concerns about high nitrates in groundwater, most farmers would at least be willing to investigate such claims and how they can get into the act.

Thanks to testing conducted recently on farms through the Nebraska On-Farm Research Network, results have shown that sensor-based fertigation systems may offer the tools to accomplish that kind of nitrogen efficiency, compared to more conventional means of feeding the crop in-season.

Using canopy crop image data captured weekly with drones,

the sensor-based tool develops a prescription to apply nitrogen fertilizer in-season at a rate that the crop needs. No more. No less.

"This program using aerial drone imagery of the crop canopy and sophisticated diagnostics to predict weekly crop nitrogen needs is the first of its kind and will rapidly become the standard as we go forward," says Nick Lammers, Precision Agronomy Solutions agronomist. "Then having the ability to plug that prescription into an already existing irrigation system to efficiently deliver prescribed nitrogen rates throughout the field makes the future even brighter for this technology."

This kind of in-season application of both nutrients and water has a proven, successful track record. "We've had the technology to measure soil water and provide constant timely irrigation recommendations for several years now," Lammers says. "What we've been missing is a way to measure the crops' need for nitrogen as the season progresses."

Autonomous Irrigation and Fertigation

Through the years, irrigation has seen significant progress, from digging ditches and laying pipes to using center pivots. Farmers have worked tirelessly to maximize their water resources. Now, with the introduction of autonomous irrigation systems, precision irrigation has taken another leap forward. This technology empowers producers with greater control over water distribution, nitrogen application, manure management, and more. Such systems enable fully autonomous watering of entire fields, 24 hours a day, 7 days a week. This ensures a consistent and timely delivery of water and nutrients directly to crops.

One of the key benefits of using this system is the ability to apply nitrogen in smaller, more precise amounts, rather than front-loading it prior to the growing season. Livestock producers can also utilize the machine to efficiently distribute manure. This flexibility allows producers to better manage their operations by applying fertilizer at lower rates throughout the entire irrigation season.

This system is adaptable to various field shapes and dramatically increases water accessibility while using up to 75% less water than traditional pivot systems. The autonomous watering machine follows the paths created by the planter and can navigate wherever the planter goes. Water and nutrients are applied in a concentrated 15-inch band over the root zone, reducing waste. This machine can be monitored and controlled from an app on a smartphone. One farmer noted that operating this system resulted in a 39% reduction in electricity consumption compared to his pivot system.

PRECISION CONSERVATION, INCREASING PROFITABILITY

As a conservation specialist with Precision Conservation Management (PCM), I work to provide Nebraska corn and soybean producers with information and recommendations that aim to protect their livelihood. Landowners need to be a part of these discussions and can sometimes be the difference between adopting an effective conservation practice or not.

Precision Conservation Management is a grassroots, commodity association-led program created by farmers, for farmers, to assist in the evaluation of in-field conservation decisions. Created in 2015, PCM has expanded to serve regions in Nebraska, Illinois, and Kentucky. The objective of PCM is to work one-on-one with farmers to analyze the costs and benefits of adopting new conservation practices, but one of the barriers to adopting new practices can be relationships between farmers and landowners.

Looking at the aggregate data published by PCM can set the stage for productive conversations between farmers and landowners about adopting conservation practices. Conversations that consider both profitability and soil health goals can create a win-win plan for both parties. PCM data could even help with rental agreement negotiations that meet the long-term soil health goals of the landowner without impacting the producer's bottom line.

By joining PCM, farmers get access to their own dedicated regional specialist, exclusive cost-share programs, and personalized data analysis demonstrating how conservation practices affect both their environmental outcomes and farm incomes. However, you do not need to be enrolled in PCM to get access to aggregated data published on their website.

Their latest publication compiles nine years of aggregated data. Here are just a few insights from this data:

- Higher yields do not always equal higher profitability. This is an important mindset shift to consider for long-term success.
- More than two passes of heavy tillage is never profitable compared to lighter tillage systems. Strip tillage is also proving to be a profitable option.
- Nitrogen applications over the university recommended rates are less profitable.
- Cover crops are the most effective tool

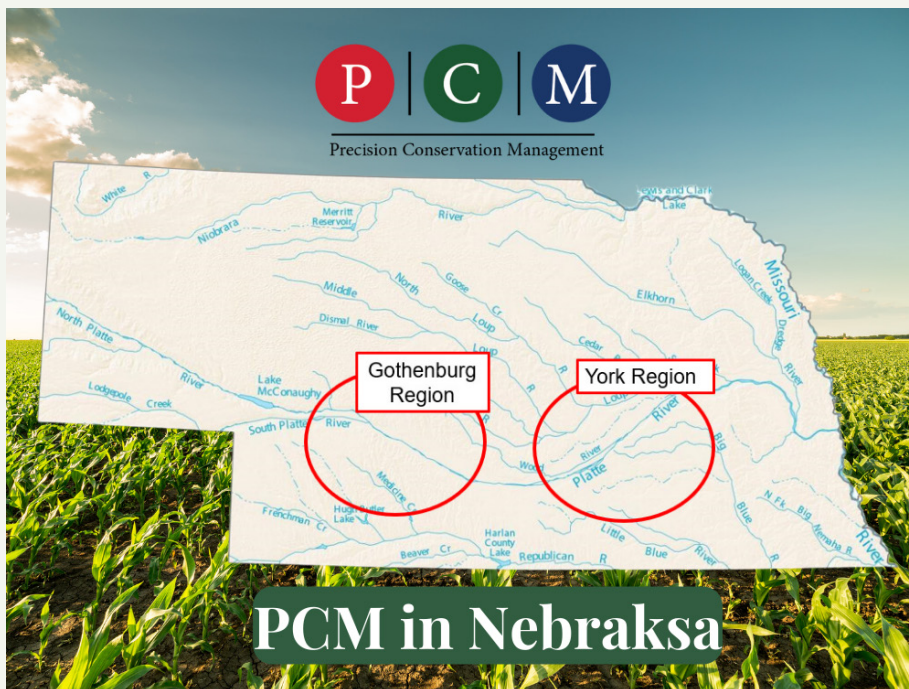
for improving water quality and soil health, although profitability remains a challenge. Several cost-share opportunities are available to farmers through PCM and other programs to make cover crops pencil out on a farm balance sheet.



Seth Norquest
Conservation Specialist

Curious to see more insights from our aggregated data, or to meet with me to get personalized data insights on your acres? You can visit www.precisionconservation.org or contact me at snorquest@precisionconservation.org or (402) 710-1987. I am eager to help you find the balance between profitability and conservation on your land.

“Landowners need to be a part of these discussions and can sometimes be the difference between adopting an effective conservation practice or not.”



CONSERVATION CONVERSATIONS

(from page 1)

All of the above are legitimate concerns. Conversation is important. As people, we seem to get hung up here. Perhaps that's due to fear, difficulty in communicating thoughts, experience from previous conversations, and/or anticipating responses that may not be true.

It's helpful to know one's "why" for a conservation project, have information on how it will benefit both parties, and resources and options available to consider.

In conversation, seek to understand and be understood. The greater people understand each other, the greater trust is built. Seek these conservation conversations with landlords/tenants where trust exists.

From there, seek to listen empathetically (with the intent to understand from the other person's frame of reference). Try

not to come up with the next question but to really listen to what the other person is saying. Look for win-win opportunities and keep an open mind.

Recognize that the benefits of conservation practices take time. Our on-farm research data has shown it takes a minimum of three years in the same location to see soil benefits including increased nutrient availability, water infiltration, and microbial populations. Most of our cover crop on-farm research studies showed reduced yields and profitability in the first three years.

However, after year three, the data shows similar to higher yields and profitability.

The National Cover Crop Survey's 2012-2016 analysis also found farmers experience a negative return in year one (-\$31/ac), minimal return in year three (\$1.42/ac), but positive return by year five (\$18/

ac) with a 3% increase in corn yields and nearly 5% in soybean.

There are several resources, both government and non-government, for cost savings help to try something, including resources listed in this publication. A recent situation in which I talked to both the landlord and tenant involved them conducting a cover crop on-farm research project on some acres of one farm. A conservation project doesn't have to involve the whole farm. It can include a small area to try and consider building from there. Feel free to contact me at the Extension Office for additional information at (402) 362-5508.



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Natural Resources District

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